Remarks

Applicant and the undersigned would like to thank the Examiner for his efforts in the examination of this application.

I. Rejection of Claim 1 under 35 USC 102(b)

The Examiner has rejected Claim 1 under 35 USC 102(b) as being anticipated by Sklar et al.

Claim 1 has been amended to more particularly point out that which Applicants regard as their invention. Specifically, an additional step has been recited of --performing two-axis motion sensing on an iris-pupil boundary of the eye--.

The tracking system of Sklar does not operate via two-axis motion sensing; rather, light intensity is plotted versus position based upon data sensed by two orthogonal linear scanning arrays (see, for example, col. 25, lines 39-45).

Claims 5-8 dependent from Claim 1 have been added to recite further aspects of the invention, wherein in Claim 5 the sensing is recited as comprising monitoring of the iris-pupil boundary using a plurality of impinging beams, as indicated in the Specification at page 12, lines 13-15. In Claim 6 the reflected beams are focused onto a detector having a data rate sufficient to detect saccadic eye movement, this data rate indicated as having a lower limit of several hundred hertz in Claim 7, as supported at page 13, lines 19-22, of the Specification. In Claim 8 the detector comprises an infrared detector, as taught in the Specification at page 14, line 23.

It is respectfully believed that Claim 1 patentably distinguishes over Sklar in reciting a corneal treatment method incorporating a novel tracking method, and that Claims 5-8 also distinguish over the cited art.

II. Rejection of Claims 3 and 4 under 35 USC 102(b)

The Examiner has rejected Claims 3 and 4 under 35 USC 102(b) as being anticipated by Bille et al. '586.

This rejection is respectfully traversed. Claim 3 recites the step of "sequencing the plurality of pulses so that a plume associated with a specific pulse does not substantially interfere with a pulse subsequent to the specific pulse." Claim 4 recites the step of "spacing each pulse in the series of pulses a distance sufficient so that a plume associated with a previous pulse does not substantially interfere with a pulse subsequent to the previous pulse."

Bille, on the other hand, teaches that "[a]lthough the duration **14** of each emission **10** is very short and will have minimal effect on peripheral tissue, an apparently random firing order is established in order to insure the peripheral affects [sic] of the laser beam on tissue area **18** are, in fact, minimized." [col. 5, lines 42-44]

Therefore, Applicants respectfully disagree that in Bille "the shots are placed in a manner wherein, inherently, the plumes of a specific pulse does not interfere with plumes of a subsequent pulse." Nowhere does Bille mention plumes of ablated tissue; therefore, there can be no inherency in a lack of interference with adjacent pulse plumes. Bille rather

teaches an avoidance of peripheral effects on tissue area, not an avoidance of subsequent pulse interference.

Therefore, it is respectfully believed that Claims 3 and 4 are not anticipated by Bille and patentably distinguish thereover.

III. Rejection of Claims 1 and 2 under 35 USC 103(a)

The Examiner has rejected Claims 1 and 2 under 35 USC 103(a) as being obvious over Sklar in combination with Isakov et al.

As amended and discussed above, Sklar neither teaches nor suggests performing a two-axis sensing of an iris-pupil boundary, nor does Isakov. Therefore, there is no teaching, either separately or in combination, to suggest this feature of Claim 1.

Claim 2 has been amended to recite the step of optically shifting the original beam path in accordance with a specific scanning pattern to create a resulting beam path that is parallel to the original beam path for maintaining a substantially constant angle of the beam path with respect to the eye (Specification, page 8, lines 19-20). Neither Sklar nor Isakov, alone or in combination, teaches or suggests an optical shifting step in order to maintain a substantially constant angle of the beam path with respect to the eye. Sklar, in fact, specifically teaches away from this step by teaching a movement of the source 21, which changes the angle of a beam impinging on the eye. Isakov teaches an electromechanical drive to move a laser and hence the beam, and does not teach an optical translation apparatus. There is no suggestion or teaching to combine an

electromechanical drive with the apparatus of Sklar to achieve that which is recited in Claim 2 of the present application.

New Claim 9 has been incorporated to further define the optically shifting step to comprise independently translating the laser beam along each of two orthogonal translation axes. Claim 10 further defines the translating step as comprising moving an X translating mirror along an X axis and moving a Y translating mirror along a Y axis substantially orthogonal to the Y axis. Claim 11 defines the mirror translating steps as being under control of a beam translation controller. Neither Sklar nor Isakov, alone or in combination, contemplate such an optical arrangement for achieving the shifting of an original beam path to a resulting beam path in parallel to the original beam. Support for these additional claims may be found in the Specification at page 8, lines 6-14.

Therefore, it is respectfully believed that both Claims 1 and 2, and claims 5-11 dependent therefrom, patentably define over the cited art.

IV. Double Patenting Rejection

The Examiner has rejected Claims 1-4 under the judicially created doctrine of obviousness-type double patenting.

A terminal disclaimer is enclosed herewith.

V. Information Disclosure Statements

The Examiner has indicated that references did not accompany the IDS submission of October 3, 2001, received at the PTO on October 9, 2001. However, as discussed in

a telephone conference with the Examiner, these references were indeed sent with the IDS form, and were apparently received by the Patent Office, as indicated by the enclosed copy of a returned post card.

The Examiner is requested to inform Applicants as to whether the nonpatent and foreign literature should be resent for consideration in the case, or if the missing references have been subsequently found and entered.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version With Markings to Show Changes Made**."

Applicant respectfully submits that the above amendments place this application in a condition for allowance, and reconsideration and passage to issue are respectfully solicited. The Applicant and the undersigned would like to again thank the Examiner for his efforts in the examination of this application and for reconsideration of the claims as amended in light of the arguments presented. If the further prosecution of the application can be facilitated through telephone interview between the Examiner and the undersigned, the Examiner is requested to telephone the undersigned at the Examiner's convenience.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that the foregoing is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Commissioner of Patents, Washington D.C. 20231, this 20th day of August, 2002.

Edward Bradley

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please enter amended Claims 1 and 2 and new Claims 5-11.

1. (amended) A method of treating a cornea of an eye so as to effect a refractive correction of the eye, the method comprising the steps of:

a) delivering a corneal ablating laser beam to an eye;

b) moving the laser beam in a pattern about the eye; [and]

c) performing two-axis motion sensing on an iris-pupil boundary of the eye; and

d) redirecting the laser beam to compensate for eye movement.

2. (amended) A method of treating a cornea of an eye to effect a refractive correction of the eye, the method comprising the steps of:

a. delivering a corneal ablating laser beam to an eye;

b. moving the laser beam in a pattern about the eye along an original optical beam path; and

c. optically shifting the original beam path in accordance with a specific scanning pattern to create a resulting beam path that is parallel to the original beam path for maintaining a substantially constant angle of the beam path with respect to the eye.

5. The method recited in Claim 1, wherein the motion sensing step comprises:

a) directing a plurality of beams to impinge on the iris-pupil boundary;

b) sensing a plurality of reflected beams from the iris-pupil boundary; and

c) determining eye movement from a monitoring of a movement of the sensed plurality of reflected beams.

6. The method recited in Claim 5, wherein the reflected beam sensing step comprises focusing the plurality of reflected beams onto a detector having a data rate sufficient to detect saccadic eye movement.

7. The method recited in Claim 6, wherein the data rate is at least several hundred hertz.

8. The method recited in Claim 6, wherein the detector comprises an infrared detector.

9. The method recited in Claim 2, wherein the optically shifting step comprises independently translating the laser beam along each of two orthogonal translation axes.

10. The method recited in Claim 9, wherein the translating step comprises moving an X translating mirror along an X axis and moving a Y translating mirror along a Y axis substantially orthogonal to the Y axis.

11. The method recited in Claim 10, wherein the mirror translating steps are under control of a beam translation controller.

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